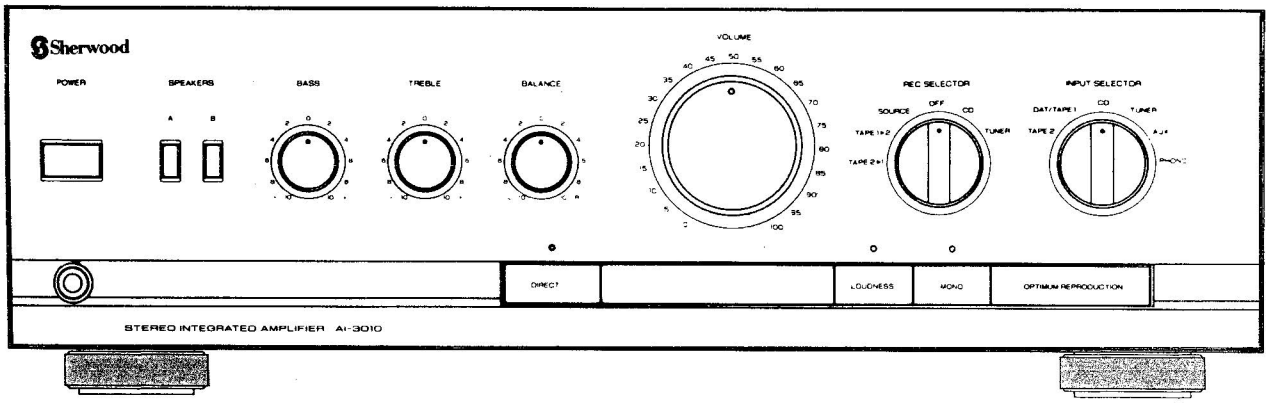
SERVICE MANUAL

AI-3010

STEREO INTEGRATED AMPLIFIER



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Sherwood

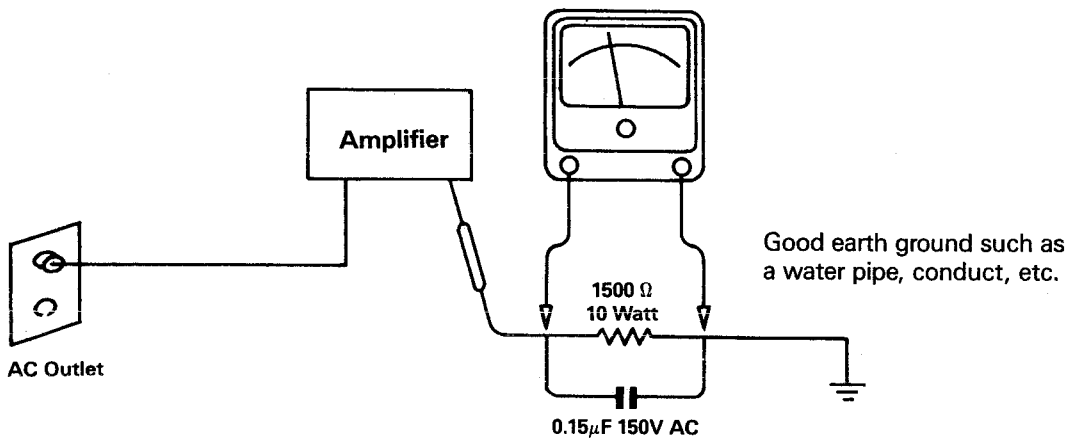
Safety Precaution

WARNING

Service should not be attempted by anyone unfamiliar with the necessary precautions on this player. The following precautions are necessary during servicing.

1. Many electrical and mechanical parts in this player have special characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristic are identified in this manual and its supplements: electrical components having such features are identified by a ⚠ in the schematic diagram and the parts list.
   Before replacing any of these components, read the parts list in this manual carefully.
   The use of substitute replacement parts that do not have the same safety characterstics as specified in the parts list may crear shock, fire or other hazards.
2. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminals, screwheads, metal overlays, etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into, a 120V AC outlet **(120V Version only)**. (Do not use a line isolation transformer during this check.) Use an AC voltmeter having 5000 Ω per volt or more sensitivity in the following manner:
   0.15μF, 150V AC capacitor, between a known good earth ground (water pipe, conduct, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 Ω resistor and 0.15μF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3volts RMS. This corresponds to 0.2mA AC. Any value exceeding this limit constitutes a potential shcok hazard and must be corrected immediately.

AC VOLT METER
(5000 Ω per volt or more sensitivity)
Reading should not exceed 0.8V



Place this probe on each exposed metallic parts.

Specifications *(USA/Canada version)*

Minimum Continuous Average Power Output per CH.,
both channels driven with no more than 0.05% THD
at 8 ohms, 20-20,000Hz 40W
Intermodulation Distortion, 60Hz:7kHz=4:1 SMPT
40W output into 8ohms 0.03%
Damping Factor at 1 kHz, 8ohms 90
Input Sensitivity for 42W output, 8ohms at 1kHz
Phono 2.5mV
Aux/Tuner 150mV
Phono Pre-amp Input overload at 1kHz, 0,01% THD 150mV
Signal to noise ratio, IHF "A" wtd/unwtd
Phono 74/70dB
Aux (CD/Video) 96/88dB
Frequency Response
Phono, RIAA 40-20,000Hz ..... ±0.5dB
Aux at 1W, −3dB 5Hz-50kHz
Loudness Contour
at 100Hz ..... +6dB
at 10kHz ..... +3dB
Tone Control
Bass at 100Hz ..... +6dB
Treble at 10kHz ..... +3dB
Channel Separation at Aux
100Hz ..... ±10dB
1kHz ..... ±10dB
10kHz 45dB
Power Consumption 130W

Power Requirement;
A: 120V 60Hz for USA & Canadian version
B: 120V/220V 60/50Hz for multi-voltage version
C: 220V 50Hz for general European version
D: 220V 50Hz for German & Italian version
E: 240V 50Hz for British & Australian version
F: 220V 50Hz for Swiss & Scandinabian version

Dimensions ..... 440(W)×125(H)×280(D)mm
17.3(W)×4.9(H)×11(D)inch
Weight (net) ..... 7.9 kg (17lbs, 6.66oz)

Specifications *(Europe version)*

Power Output per channel
- IEC standard, 63Hz to 12.5 kHz, 8ohms/4ohms 50/67W
- DIN standard, 1kHz, 8ohms/4ohms 54/74W

THD. −6dB Rated Output, 8ohms, 1kHz 0.01%
IMD. −6dB Rated Output, 8ohms 0.009%
Damping Factor at 1 kHz, 8ohms 90
Input Sensitivity for 42W output, 8ohms at 1kHz
- Phono 2.5mV
- Aux/Tuner 150mV

Phono Pre-amp Input Overload at 1kHz, 0.1% THD 50mV
Signal to Noise ratio, IEC "A" wtd/unwtd
- Phono: 5 mV input, 2.2kohm shorted, VOL ADJ 42W 74/70dB
- Aux: 500 mV input, 22kohm shorted, VOL ADJ 42W 95/88dB

Frequency Response
- Phono, RIAA 40-20,000Hz ..... ±0.5dB
- Aux at 1W, −3dB 5Hz-50kHz

Loudness Contour
- at 100Hz ..... +6dB
- at 10kHz ..... +3dB

Tone Control
- Bass at 100Hz ..... ±10dB
- Treble at 10kHz ..... ±10dB

Power Consumption 330W

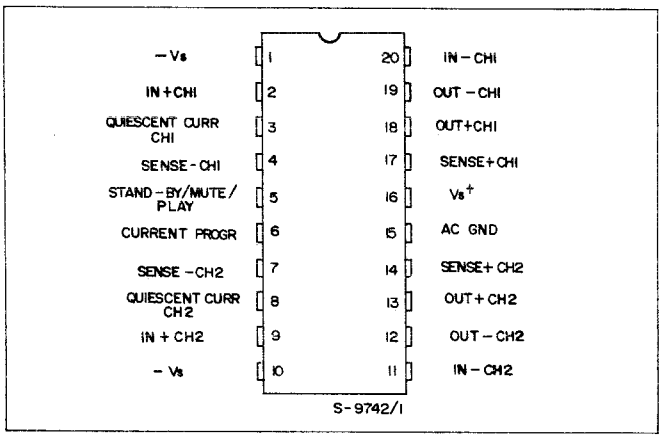
Power Requirement;
- A: 120V 60Hz for USA & Canadian version
- B: 120V/220V 60/50Hz for multi-voltage version
- C: 220V 50Hz for general European version
- D: 220V 50Hz for German & Italian version
- E: 240V 50Hz for British & Australian version
- F: 220V 50Hz for Swiss & Scandinabian version

Dimensions ..... 440(W)×125(H)×280(D)mm
17.3(W)×4.9(H)×11(D)inch

Weight 7.9kg (17lbs, 6.66oz)

Note: Specifications and design subject to change without notice for improvements. Component and circutry are subject to modification to insure best operation under differing local conditions. This manual is based on the European standard, and provides information on regional circuit modification through use of aletrnate schematic diagrams, and information on regional component variations through use of parts list.

Circuit Description

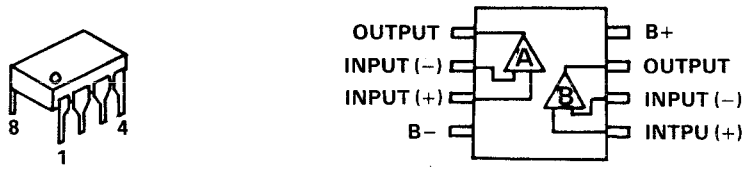


— TDA 7250: IC 301 (differential Amp & Vlotage driver IC)

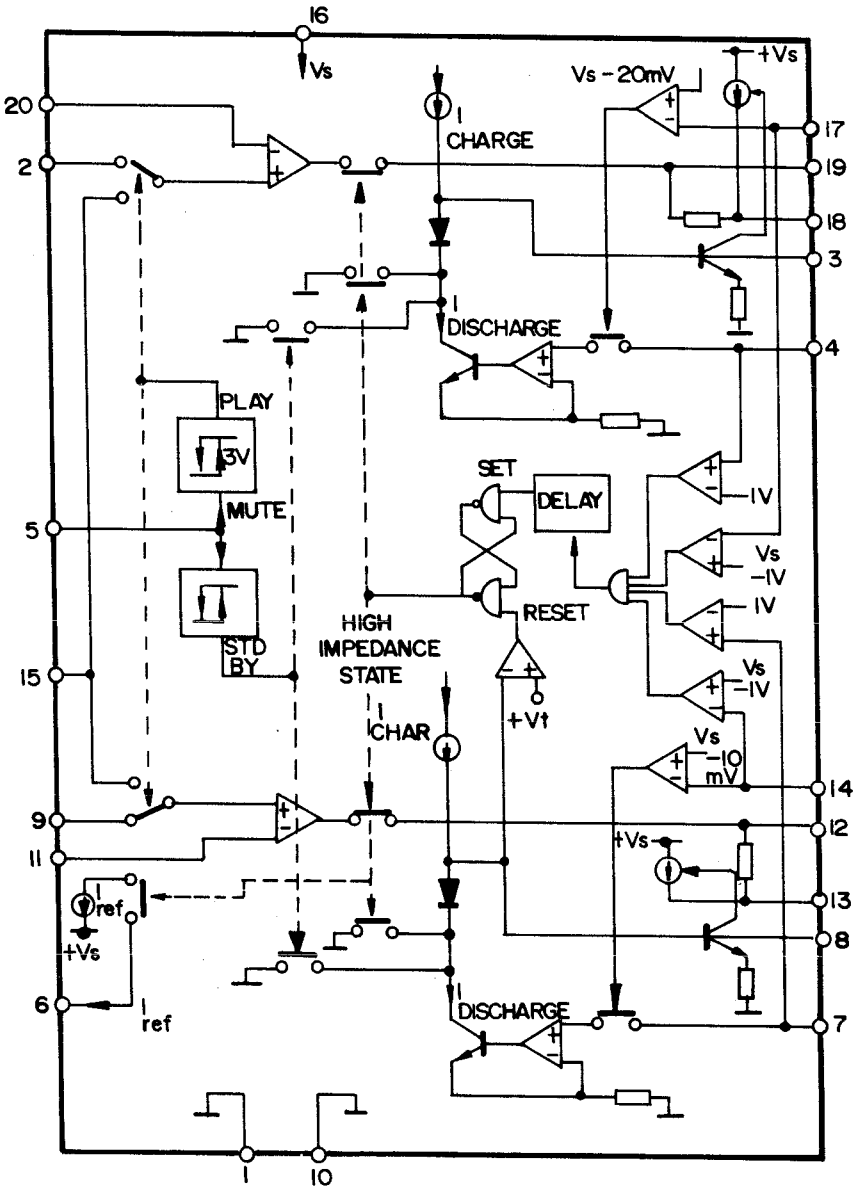
Pin Functions

No.	NAME	FUNCTION
1	V5-POWER SUPPLY	Negative supply voltage.
2	NON-INV. INP. CH. 1	Channel 1 input signal.
3	QUIESC. CURRENT CONTR. CAP. CH 1	This capacitor works as an integrator, to control the quiescent current to output devices in no-signal conditions on channel 1.
4	SENSE (−) CH. 1	Negative voltage sense input for overload protection and for automatic quiescent current control.
5	ST. BY/MUTE/PLAY	Three-functions terminal. For Vin=1 to 3V, the device is in MUTE and only quiescent current flows in the power stages; — for Vin < 1V, the device is in STAND-BY mode and no quiescent current is present in the power stages; — for Vin ㉓ 3V, the device is fully active.
6	CURRENT PROGRAM	High impedance power-stages monitor.
7	SENSE (−) CH. 2	Negative voltage sense input for overload protection and for automatic quiescent current control.
8	QUIESC. CURRENT CONTR. CAP. CH. 2	This capacitor works as an integrator, to control the quiescent current to output devices in no-signal conditions on channel 2. If the voltage at its terminals drops under 250mV, it also resets the device from high-impedance state of output stages.
9	NON-INV. INP. CH. 2	Channel 2 input signals.
10	V5-POWER SUPPLY	Negative supply voltage.
11	INVERT. INP. CH. 2	Feedback from output (channel 2).
12	OUT (−) CH. 2	Out signal to lower driver transistor of channel 2.
13	OUT (+) CH. 2	Out signal to higher driver transistor of channel 2.
14	SENSE (+) CH. 2	Positive voltage sense input for overload protection and for automatic quiescent current control.
15	COMMON AC GROUND	AC input ground in MUTE condition.
16	V5+POWER SUPPLY	Positive supply voltage.
17	SENSE (+) CH. 1	Positive voltage sense input for overload protection and for automatic quiescent current control.
18	OUT (+) CH. 1	Out signal to high driver transistor of channel 1.
19	OUT (−) CH. 1	Out signal to low driver transistor of channel 1.
20	INVERT. INP. CH. 1	Feedback from output (channel 1).

– KIA 75559P/NJM 2068DD; IC 101, 102, 201, 202



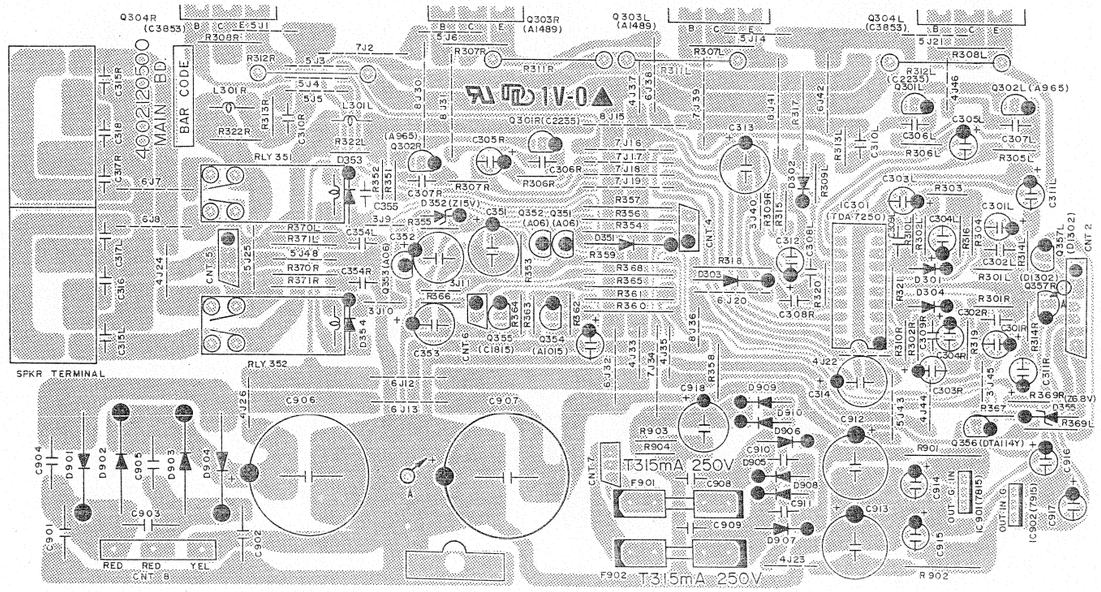
Internal Block Diagram (TDA 7250; IC 301)



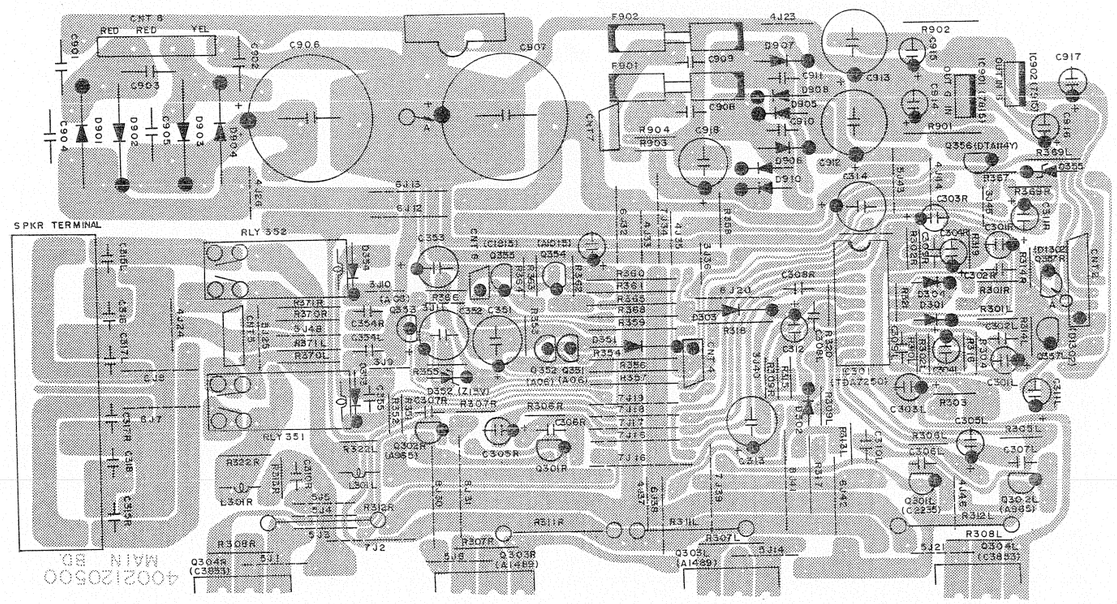
P.C. Boards *(Top & Bottom Views)*

Main P.C. Board 4002120500

(TOP VIEW)

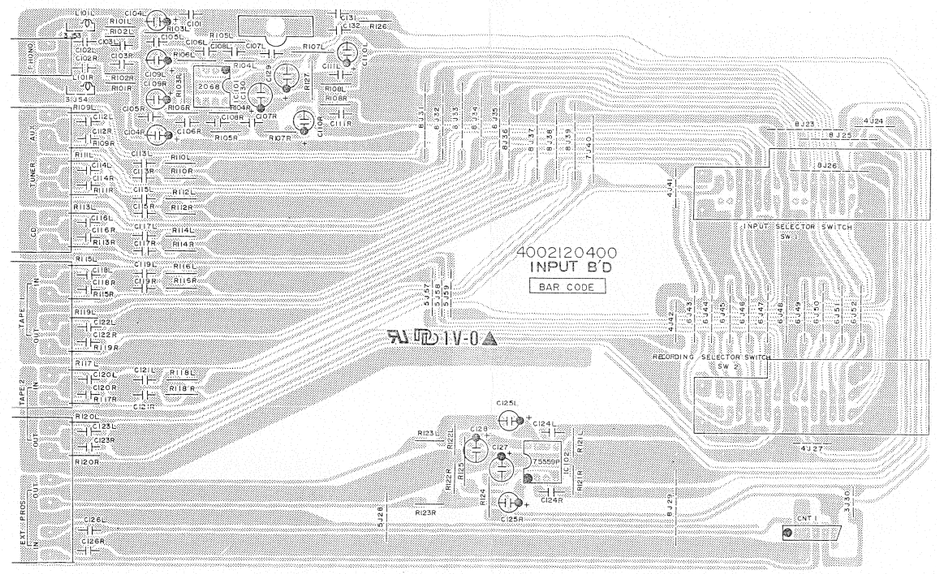


(BOTTOM VIEW)

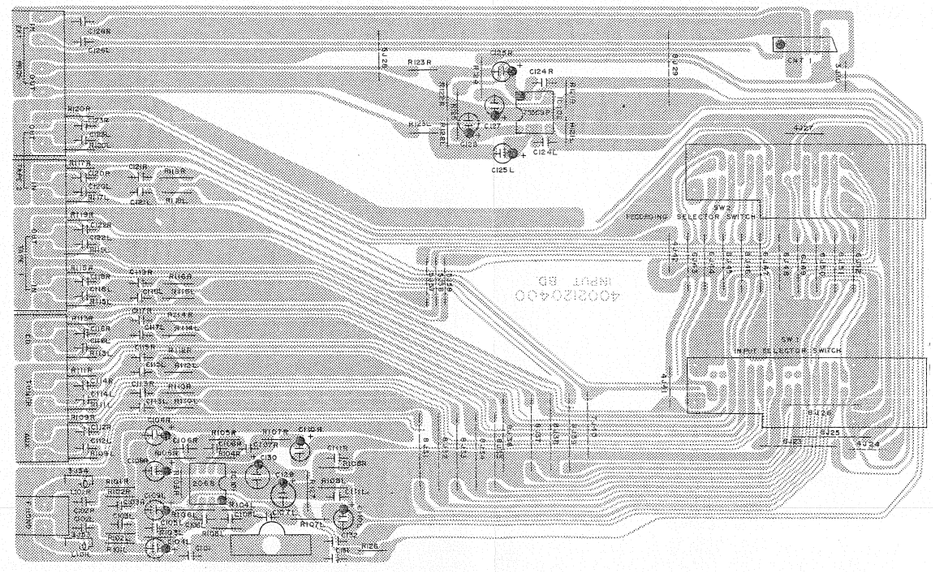


Input Board 4002120400

(TOP VIEW)

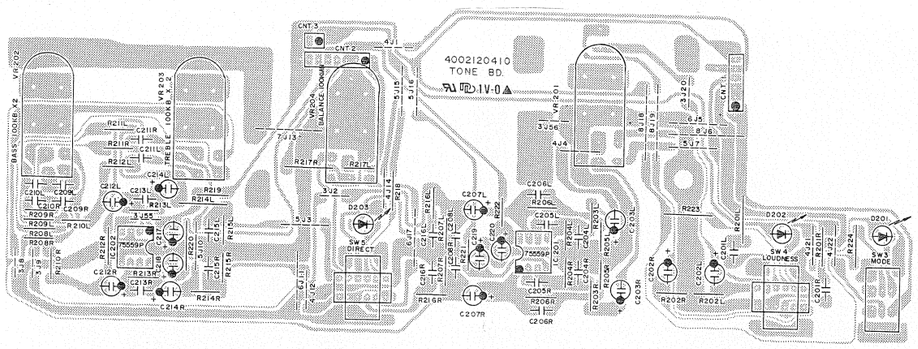


(BOTTOM VIEW)

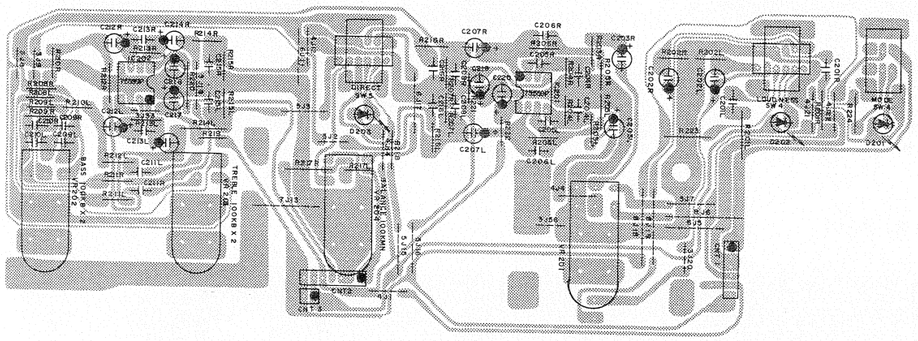


Tone Board 4002120410

(TOP VIEW)

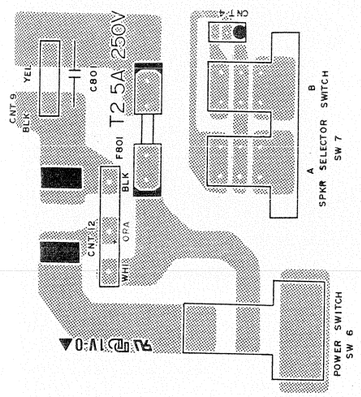


(BOTTOM VIEW)

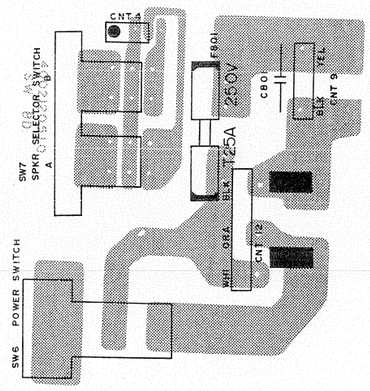


Switch Board 4002120520

(TOP VIEW)

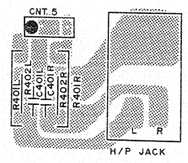


(BOTTOM VIEW)



Headphone Board 4002120510

(TOP VIEW)



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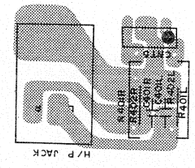


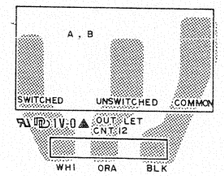
Posistor Board 4002120520

(TOP VIEW)

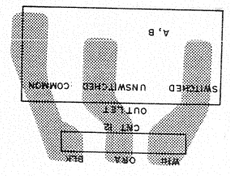
(BOTTOM VIEW)

Outlet Board 4002120530

(TOP VIEW)



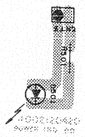
(BOTTOM VIEW)



Power Indicator Board 4002120420

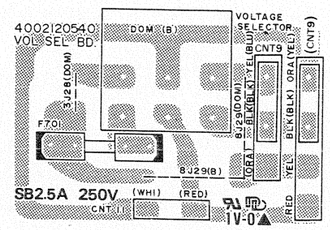
(TOP VIEW)

(BOTTOM VIEW)

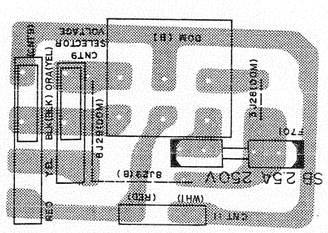


Voltage Selector Board 4002120540

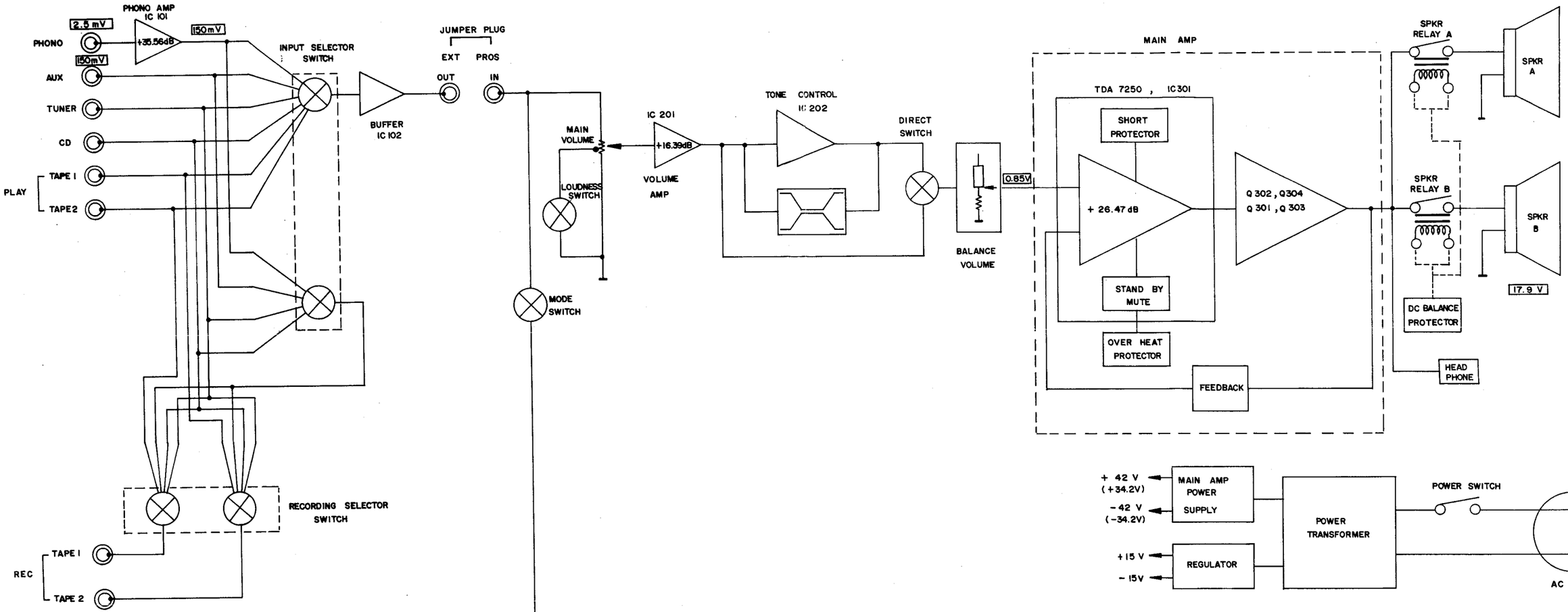
(TOP VIEW)



(BOTTOM VIEW)

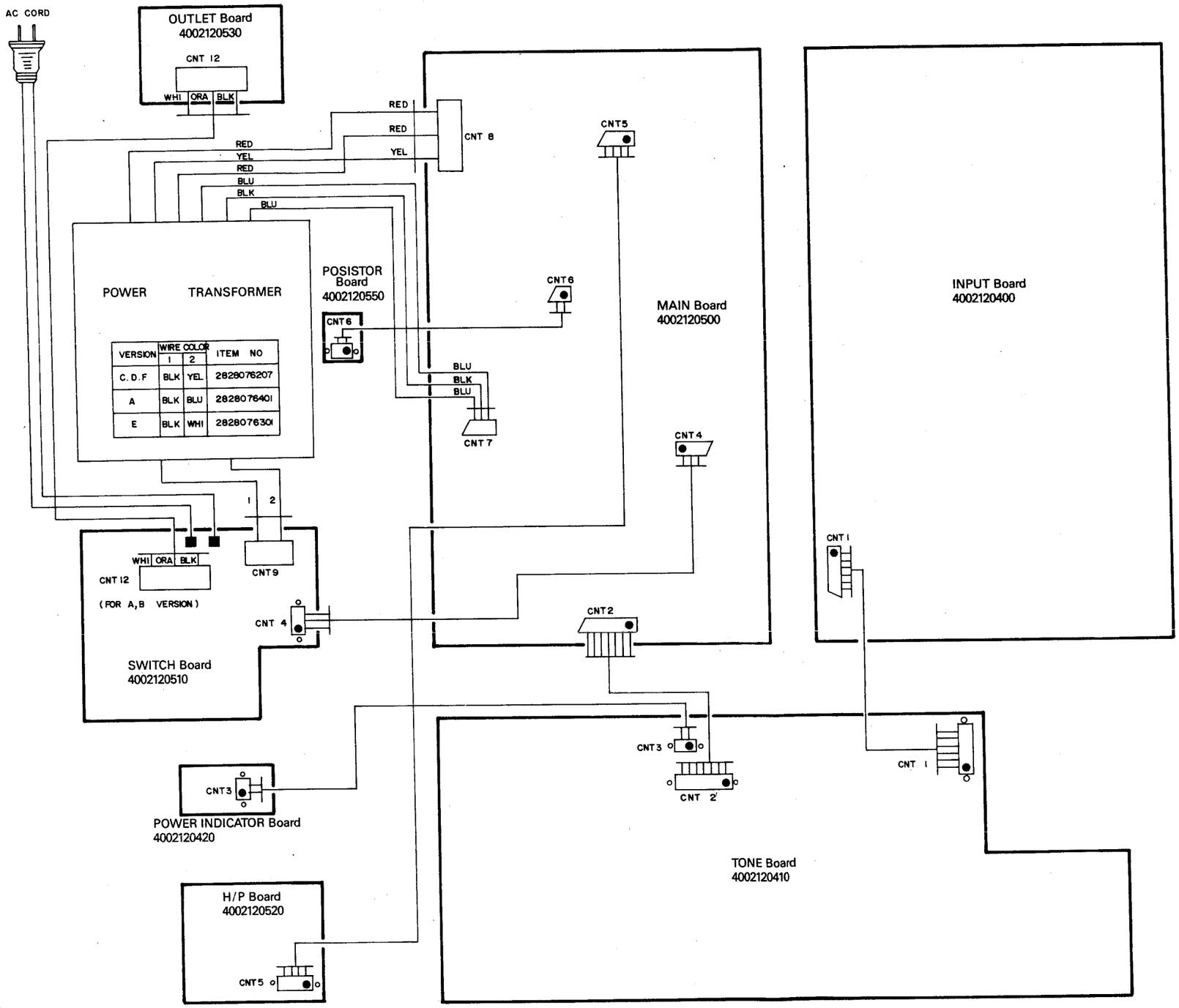


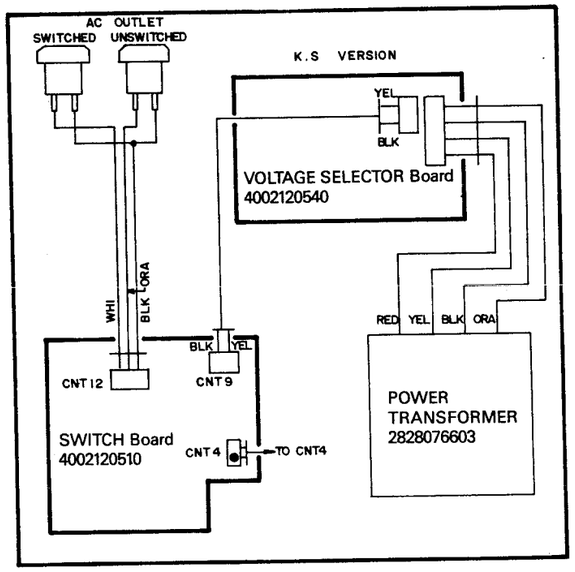
Block Diagram

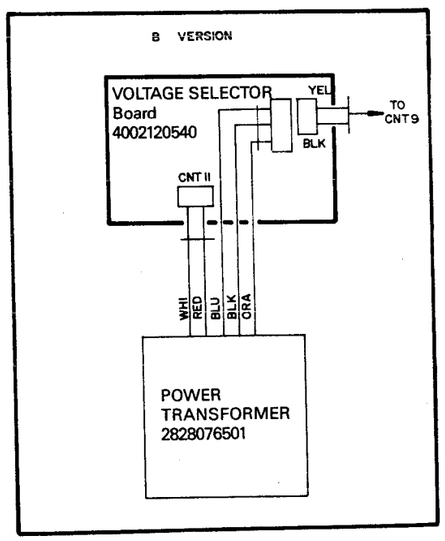


RIGHT CHANNEL (SAME AS THE LEFT CHANNEL)

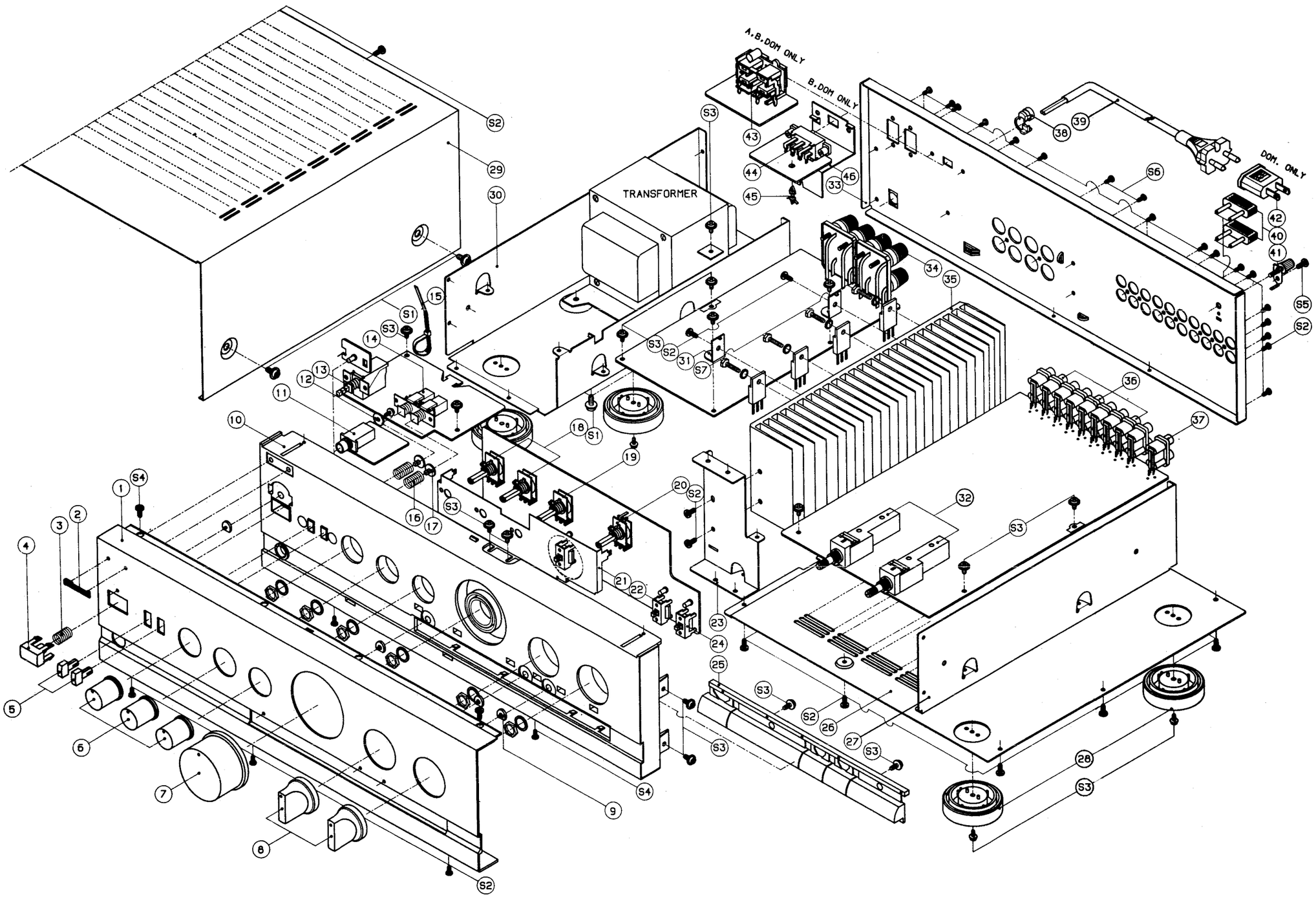
Wiring Diagram







Exploded View *(Cabinet & Chassis)*



Electrical Parts List

PRODUCT SAFETY NOTICE: Products marked with ⚠ have special characteristics important to safety. If you replace any of these components, carefully read the product safety notice of this manual. Don't degraded the safety of the product through improper servicing. Remark meaning for version, therefore refer to power requiement of Specifications in this manual. Resistors & Capacitors tolerance; D: (±5%), J: (±0.5%), K: (±10%), M: (±20%), Z: (+80%, −20%).

Ref. No.	Part No.	Description	Remark
Main P.C. Board 4002120500			
Capacitors			
C301	3479247971	Electric SA 4.7μF 50V M	
C302	3579101130	Ceramic 100pF 50V J	
C303	3479222031	Electric SA 22μF 16V M	
C304	3479268871	Electric SA 0.68μF 50V M	
C305	3409210121	Electric SA 100μF 10V M	
C306/C307	3579151130	Ceramic 150pF 50V J	
C308/C309	3579101130	Ceramic 100pF 50V J	
C310	3579150130	Ceramic 15pF 50V J	
C311	3409210121	Electric SA 100μF 10V M	
C312	3479222971	Electric SA 2.2μF 50V M	
C313/C314	3409210171	Electric SA 100μF 50V M	
C315-C318	3579222530	Ceramic 2200pF 50V Z	
C351	3409247111	Electric SA 470μF 6.3V M	
C352	3479222141	Electric SA 220μF 25V M	
C353	3479222121	Electric SA 220μF 10V M	
C354	3679473120	Mylar 0.047μF 100V J	
C355	3679103120	Mylar 0.01μF 100V J	
C901-C905	3509103450	Ceramic 0.01μF 500V K	D
C906/C907	3419547295	Electric SA 4700μF 50V M	
C908/C909	3679473120	Mylar 0.047μF 100V J	D
C910/C911	3679223120	Mylar 0.022μF 100V J	
C912/C913	3409247161	Electric SA 470μF 35V M	
C914-C917	3479210071	Electric AC 10μF 50V M	
C918	3479210171	Electric SA 100μF 50V M	
Connectors			
CNT2	4428505410	Plug 7P	
CNT4	4428505710	Plug 3P×2EA	
CNT5	4428505610	Plug 4P	
CNT6	4428508210	Plug 2P	
CNT7	4428505710	Plug 3P×2EA	
CNT8	4428525790	AC 3P	
Coil			
L301	2648001010	Inductor 0.5μH	
Diode			
D301-D304	2258306101	1N4148	
D351	2258306101	1N4148	
D352	2258522121	Zener, MTZ 15V	
D353/D354	2258106101	1N4002	
D355	2258522113	Zener, MTZ 6.8V	
D901-D904 ⚠	2058100136	1N5402	
D905-D910 ⚠	2258106100	1N4002	
Fuses			
F901 ⚠	5508301435	T 315mA 250V	
F902 ⚠	5508301435	T 315mA 250V	

Ref. No.	Part No.	Description	Remark
IC's			
IC301	2178000001	TDA 7250, Drive IC	
IC901	2168611103	GL 7815, Regulator	
IC902	2168613107	GL 7915, Regulator	
Relays			
RLY351	5528001480	DH 24D2-OT(DEC) 24V/3A	
RLY352	5528001480	DH 24D2-OT(DEC) 24V/3A	
Resistors: All Resistors are 1/5W carbon film ±5% tolerance, unless otherwise specified. M is metal film, M.O is metal oxide and C is cement type.			
R301/R304	3069223970	22kΩ	
R302	3069272970	2.7kΩ	
R303	3069104970	100kΩ	
R305/R306	3069391970	390Ω	
R307/R308	3069101970	100Ω	
R309/R310	3069680970	68Ω	
R311/R312 ⚠	3059158682	C., 0.15Ω 3W	
R313	3069153970	15kΩ	
R314	3069751970	750Ω	
R315	3069103970	10kΩ	
R316-R319	3069150970	15Ω	
R320/R321	3069105970	1MΩ	
R351/R352	3069153970	15kΩ	
R353	3069182970	1.8kΩ	
R354	3069183970	18kΩ	
R355	3069101970	100Ω	
R356/R357	3069390970	39Ω	
R358/R361	3069102970	1kΩ	
R359	3069104970	100kΩ	
R360/R363	3069103970	10kΩ	
R362	3069473970	47kΩ	
R364	3069222970	2.2kΩ	
R365	3069513970	51kΩ	
R366	3069471970	470Ω	
R367	3069105970	1MΩ	
R368	3069473970	47kΩ	
R369	3069102970	1kΩ	
R370/R371	3069220970	22Ω	
R901/R902 ⚠	3039339476	M.O., 3.3Ω 1W	
R903/R904	3069472970	4.7kΩ	
Transistors			
Q301	2228406120	KTC 2235Y	
Q302	2228106107	KTA 965Y	
Q303	2028116105	2SA 1489	
Q304	2028416108	2SC 3853	
Q351-Q353	2208609114	MPS A06	
Q354	2208206105	KTA 1015Y	
Q355	2208606104	KTC 1815Y	
Q356	2208222105	DTA 114Y	
Q357	2208606112	2SD 1302S	

Ref. No.	Part No.	Description	Remark
Input Board 4002120400			
Capacitors			
C101	3579103530	Ceramic 0.01μF 50V Z	
C102	3579220130	Ceramic 22pF 50V J	
C103	3579680130	Ceramic 68pF 50V J	
C104	3479247971	Electric SA 4.7μF 50V M	
C105	3579100130	Ceramic 10pF 50V J	
C106	3579222530	Ceramic 2200pF 50V Z	
C107/C111	3679562120	Mylar 0.0056μF 100V J	
C108	3679182120	Mylar 0.0018μF 100V J	
C109	3479210071	Electric SA 10μF 50V M	
C110	3479268871	Electric SA 0.68μF 50V M	
C112-C123	3579101130	Ceramic 100pF 50V J	D
C124	3579471130	Ceramic 470pF 50V J	
C125	3479222041	Electric SA 22μF 25V M	
C126	3579101130	Ceramic 100pF 50V J	D
C127-C130	3479247041	Electric SA 47μF 25V M	
C131/C132	3579103530	Ceramic 0.01μF 50V Z	D
Connector			
CNT1	4428505810	Plug 6P	
Coil			
L101	2648601470	Inductor 50mH	D
ICs			
IC101	2168020106	NJM 2068DD, OP Amp	
IC102	2168206104	KIA 75559, OP Amp	
Resistors			
R101	3069272970	2.7kΩ	
R102/R103	3069913970	91kΩ	
R104	3069564970	560kΩ	
R105	3069433970	43kΩ	
R106	3069821970	820Ω	
R107	3069471970	470Ω	
R108	3069104970	100kΩ	
R109	3069102970	1kΩ	
R110/R112	3069104970	100kΩ	
R111/R113	3069102970	1kΩ	
R114/R116	3069104970	100kΩ	
R115/R117	3069102970	1kΩ	
R118	3069104970	100kΩ	
R119/R120	3069102970	1kΩ	
R121/R122	3069104970	100kΩ	
R123	3069471970	470Ω	
R124-R127	3069470970	47Ω	

Ref. No.	Part No.	Description	Remark
Tone Board 4002120410			
Capacitors			
C201	3579331130	Ceramic 330pF 50V J	
C202	3479215871	Electric SA 0.15μF 50V M	
C203/R207	3479247971	Electric SA 4.7μF 50V M	
C204	3579101130	Ceramic 100pF 50V J	
C205	3579331130	Ceramic 330pF 50V J	
C206	3579221130	Ceramic 220pF 50V J	
C208	3579102530	Ceramic 1000pF 50V Z	
C209/C210	3679223120	Mylar 0.022μF 100V J	
C211	3579561130	Ceramic 560pF 50V J	
C212	3479210971	Electric SA 1μF 50V M	
C213	3579330130	Ceramic 33pF 50V J	
C214	3479247971	Electric SA 4.7μF 50V M	
C215/C216	3579561130	Ceramic 560pF 50V J	
C217-C220	3479247041	Electric SA 47μF 25V M	
Connectors			
CNT1	4119106153	Ass'y 6P to Front B'D	
CNT2	4119107153	Ass'y 7P to Main B'D	
CNT3	4119102202	Ass'y 2P to Power Indicator B'D	
Diode			
D201-D203	2371124502	LED SLR 54YCD	
IC's			
IC201/IC202	2168206104	KIA 75559P, OP AMP	
Resistors			
R201	3069473970	47kΩ	
R202	3069362970	3.6kΩ	
R203	3069471970	470Ω	
R204	3069154970	150kΩ	
R205	3069102970	1kΩ	
R206	3069562970	5.6kΩ	
R207	3069104970	100kΩ	
R208/R211	3069223970	22kΩ	
R209	3069684970	680kΩ	
R210	3069333970	33kΩ	
R212	3069203970	20kΩ	
R213	3069225970	2.2MΩ	
R214	3069471970	470Ω	
R215	3069104970	100kΩ	
R216/R217	3069102970	1kΩ	
R218	3069821970	820Ω	
R219-R222	3069470970	47Ω	
R223/R224	3069821970	820Ω	

Ref. No.	Part No.	Description	Remark
Power Indicator Board 4002120420			
Connector			
CNT3	4119102103	Ass'y 2P to Front B'D	
Diode			
D501	2371124702	LED SLR54URC	
Resistor			
R501	3069102970	1kΩ	

Ref. No.	Part No.	Description	Remark
Head Phone Board 4002120520			
Capacitor			
C401	3579561130	Ceramic 560pF 50V J	D
Connector			
CNT5	4119104353	Ass'y 4P to Main B'D	
Resistors			
R401 R402	3039331476 3069153970	M.O., 330Ω 1W 1.5kΩ	
Switch Board 4002120510			
Capacitor			
C801	3579472410	Ceramic 0.0047μF 400V K	
Connector			
CNT4 CNT9 CNT12	4119103203 4428525780 4428525790	Ass'y 3P to Main B'D Plug AC 2P Plug AC 3P (A,B,K,S)	
Fuses			
F801 ⚠ F802 ⚠	5508302535 5508103021	T 2.5A/250V SB 5A/125V	C,D,E,F A,B, Domestic
Posistor Board 4002120520			
Posistor			
R601	2438012100	PTH487A01-BE222TS	
Voltage Selector Board 4002120540			
Fuse			
F701 ⚠	5508102530	SB 2.5A/250V	B, Domestic

Mechanical Parts List (Cabinet & Chassis)

No.	Description	Part No.	Q'ty	Remark
1	Panel Front, Black	048602017711	1	
2	Badge, Sherwood	048535031911	1	
(2)	Badge	(048535032511)	1	Domestic
3	Spring	6555004380	1	
4	Button Power	8545074310	1	
5	Button Speaker	8545074910	2	
6	Knob Rotary	048643004811	3	
7	Knob VR Main	048643005011	1	
8	Knob Function	048643004711	2	
9	LED Guide	8555031410	4	
10	Body Front	048521007211	1	
11	Jack Phone	4438005020	1	
12	Washer	8305003810	1	
13	Switch Push, Power	4628055910	1	
14	Switch Push, Speaker	4628056610	1	
15	Cable Tie	6528000410	1	
16	Spring	6555002510	2	
17	Insert Button	6055003210	2	
18	VR 100KB×2, Bass/Treble	3208059610	2	
19	VR 100KMN, Balance	3208059710	1	
20	VR Main	3208058210	1	
21	Shield Fence	6163108910	1	
22	Switch Push (2/4)	4628056510	2	
23	Bracket Heatsink	6503016710	1	
24	Switch Push (2/2)	4628038810	1	
25	Button Function	048543028411	1	
26	Cover Bottom	6122415810	1	
27	Frame Right	6123013110	1	
28	Foot, Gold	046033101611	4	B,C,D,E,F
(28)	Foot, Gold	(046033101711)	4	Domestic
(28)	Foot-Front, Gold	(046033101611)	2	A
(28)	Foot-Rear, Black	(6033101610)	2	A
29	Cover Top, Black	046122021511	1	
30	Frame Left	6122901710	1	
31	Bracket P.C. Board	6505081610	2	
32	Switch Rotary	4608002310	2	
33	Chassis Back, Black	046102029011	1	Domestic
(33)	Chassis Back, Black	(046102029021)	1	A
(33)	Chassis Back, Black	(046102029031)	1	B
(33)	Chassis Back, Black	(046102029041)	1	C
(33)	Chassis Back, Black	(046102029051)	1	D
(33)	Chassis Back, Black	(046102029061)	1	E
(33)	Chassis Back, Black	(046102029071)	1	F
34	Terminal Speaker	4408105810	1	
35	Heatsink Power	7503012310	1	
36	Jack RCA, 6P	4438103210	3	
37	Jack RCA, 2P	4438103010	1	
38	Cord Stopper, Black	6513000310	1	Domestic
(38)	Cord Stopper, Black	(6518000710)	1	A,B
(38)	Cord Stopper, Black	(6518000111)	1	C,D,F
(38)	Cord Stopper, Black	(6513000210)	1	E
39	Cord AC Power, Black	4308001610	1	Domestic
(39)	Cord AC Power, Black	(4308001410)	1	A,B
(39)	Cord AC Power, Black	(4308000430)	1	C,D,F
(39)	Cord AC Power, Black	(4308000610)	1	E
40	Plug Jumper	4328204210	2	
41	Terminal Ground	4408104910	1	
42	Adapter	4428300310	1	Domestic
43	Outlet, Black	4448100410	1	Domestic
(43)	Outlet, Black	(4448103210)	1	A,B
44	Voltage Selector	4618006510	1	B, Domestic
45	Fastener	6528300810	1	B, Domestic
46	Bracket P.C. Board	6505108610	1	B, Domestic

No.	Description	Part No.	Q'ty	Remark
Screws				
S1	WSAM 4×8 ZNB	8159440083	8	
S2	#2 BTC 3×8 ZNB	8109230083	37	
S3	#2 WPTC 3×8 ZNY	8159230081	23	
S4	#2 FTC 3×8 ZNB	8129230083	4	
S5	#2 PTC 4×6 ZNY	8119240061	1	
S6	Ground	8155000710	2	
S7	HEX MSW 3×12 ZNY	8499130121	4	

Schematic Diagram

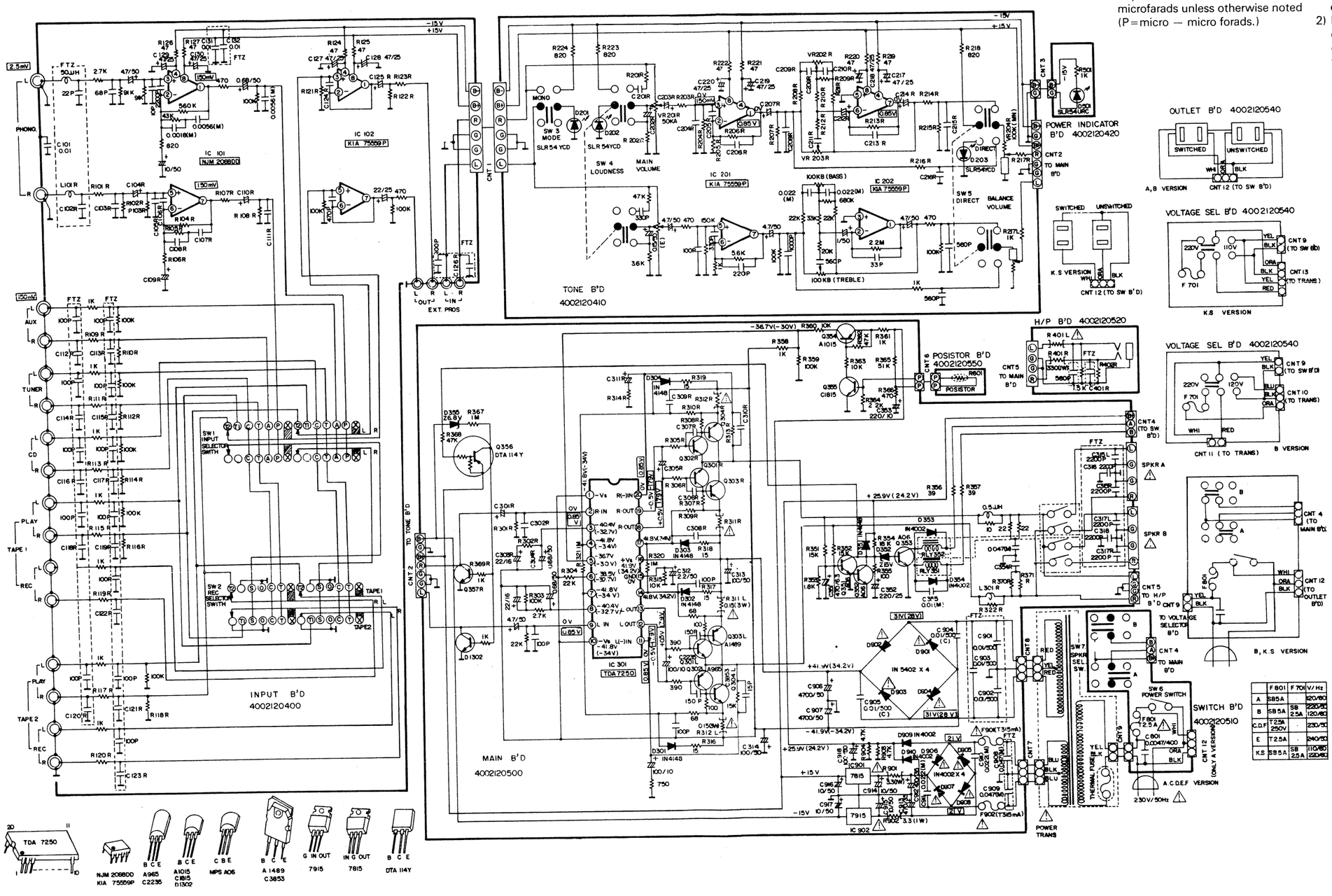
NOTES:

1. Resistance values are indicated in ohms unless othewise specified (K=1,000 M=1,000,000)
2. Capacitance values are shown in microfarads unless otherwise noted (P=micro — micro forads.)

CAUTION:

Safety precautions to be followed during servicing

1) Since those parts morked ⚠ with are critical parts for safety use the one described parts list.
2) Before returning the receiver to the custaner make appropriate leakage current or resistance measurements to determine that exposed parts are property insulated from the supply circuit.



	F801	F701	V/Hz
A	SB5A		120/60
B	SB5A	SB 2.5A	220/50
C,D,F	T2.5A 250V		230/50
E	T2.5A		240/50
K,S	SB5A	SB 2.5A	110/60 220/50